

WHAT IS CLAIMED IS:

1. An apparatus for installing a length of wire between two crimps, the apparatus comprising:
 - a wire output guide;
 - a crimp punch tool located in front of the wire output guide;
 - a first actuator operatively connected to the crimp punch tool;
 - a wire cutter tool adjacent to the crimp punch tool; and
 - a second actuator operatively connected to the wire cutter tool.
2. The apparatus according to claim 1, further comprising a spool holder for receiving a wire spool from which the wire is provided.
3. The apparatus according to claim 2, wherein the spool holder comprises a spindle.
4. The apparatus according to claim 2, further comprising a brake operatively connected to the wire spool.
5. The apparatus according to claim 4, wherein the brake comprises a friction pad.
6. The apparatus according to claim 1, further comprising a wire gripper.
7. The apparatus according to claim 6, wherein the wire gripper comprises:
 - a wire gripper actuator having a movable part with a free end, the movable part being selectively movable between an elongated position and a retracted position; and
 - a seat in registry with the free end;whereby the wire is held by frictional engagement between the free end of the movable part and the seat when the movable part is at the elongated position.
8. The apparatus according to claim 7, wherein the wire gripper actuator is a pneumatic linear actuator connected to a pneumatic source.

9. The apparatus according to claim 8, wherein the wire gripper actuator comprises:
 - a position sensor located on the wire gripper actuator, the position sensor generating signals indicative of the position of the free end with reference to the seat;
 - a flow regulator operatively connected to the wire gripper actuator; and
 - a bypass valve selectively movable between an opened and a closed position in response to the signals received from the position sensor;whereby the bypass valve is moved to the opened position when the free end of the wire gripper actuator is proximate the seat.
10. The apparatus according to claim 1, further comprising a pneumatic valve package connected to a pneumatic source, the pneumatic valve package receiving control signals from a computer.
11. The apparatus according to claim 10, further comprising an air accumulator located between the pneumatic source and the pneumatic valve package.
12. The apparatus according to claim 1, further comprising a wire tension mechanism located upstream of the wire output guide.
13. The apparatus according to claim 12, wherein the wire tension mechanism further comprises:
 - a swing arm having a first and a second end, the first end being pivotally connected to the apparatus;
 - a first pulley pivotally connected to the second end of the swing arm; and
 - a second pulley pivotally connected to the apparatus.
14. The apparatus according to claim 13, wherein the wire tension mechanism further comprises a wire feeding actuator having a movable part with a free end, the movable part of the wire feeding actuator being selectively movable between an elongated position and a retracted position, the wire feeding

actuator being configured and disposed so that the second end of the swing arm moves downwards when its movable part is at the elongated position.

15. The apparatus according to claim 14, wherein the swing arm further comprises a side pin on one side thereof to receive the free end of the movable part of the wire feeding actuator.
16. The apparatus according to claim 14, wherein the wire tension mechanism further comprises a third pulley pivotally connected to the apparatus.
17. The apparatus according to claim 1, wherein the wire cutter tool is slidably mounted inside a holding plate that is operatively connected to the second actuator.
18. The apparatus according to claim 1, wherein the crimp punch tool comprises a plate provided with a punch tip projecting from a bottom side thereof.
19. The apparatus according to claim 18, further comprising a wire retainer tool adjacent to the crimp punch tool, the wire retainer tool having a tip configured and disposed to position the wire with reference to the crimps upon activation of the first actuator.
20. The apparatus according to claim 19, further comprising a second wire retainer tool opposite the first wire retainer tool with reference to the crimp punch tool, the second retainer tool having a tip configured and disposed to position the wire with reference to the crimps upon activation of the first actuator.
21. The apparatus according to claim 20, wherein at least one of the wire retainer tools has a tip projecting closer to the wire than that the other wire retainer tool.
22. The apparatus according to claim 20, wherein the first and second wire retainer tools are each connected to a corresponding retainer plate by at least one spring.

23. The apparatus according to claim 20, wherein at least one of the wire retainer tools comprises a slot in its tip to receive the wire.
24. The apparatus according to claim 1, further comprising a retention system to hold a mechanical structure in which the crimps are provided.
25. The apparatus according to claim 24, wherein the retention system is a vacuum table.
26. The apparatus according to claim 1, further comprising means for positioning the apparatus with reference to reference points on the mechanical structure.
27. A method of installing a wire in a crimp, the method comprising:
 - positioning the wire coming out of a wire output guide into the crimp;
 - punching the crimp to close it over the wire; and
 - cutting the wire adjacent to the crimp.
28. The method according to claim 27, further comprising:
 - gripping the wire upstream of the wire output guide before positioning the wire into the crimp.
29. A method of installing a length of wire between a first and a second crimp, the method comprising:
 - positioning an end of a continuous wire extending out of a wire output guide in the first crimp;
 - punching the first crimp to close it over the wire;
 - moving the wire output guide away from the first crimp to pull some of the wire out of the wire output guide;
 - positioning the wire in the second crimp;
 - punching the second crimp to close it over the wire; and
 - cutting the wire upstream of the second crimp.
30. The method according to claim 29, further comprising:

gripping the wire upstream of the wire output guide before positioning the wire into the first crimp;
releasing the grip on the wire before moving the wire output guide away from the first crimp; and
gripping the wire upstream of the wire output guide before positioning the wire into the second crimp.

31. The method according to claim 29, wherein cutting the wire upstream of the second crimp comprises:

moving a cutter at a cutting location upstream of the second crimp; and
gripping the wire upstream of the wire output guide before cutting the wire.

32. The method according to claim 29, further comprising:

keeping a substantially constant tension in the wire when moving the wire output guide away from the first crimp.

33. The method according to claim 29, wherein gripping the wire upstream of the wire output guide comprises:

activating a pneumatic actuator for holding the wire between a free end of a movable part of the actuator and a seat.

34. The method according to claim 33, wherein activating the pneumatic linear actuator comprises:

sensing the position of the free end of the movable part of the actuator;
initially supplying pressurized air to the actuator at a reduced speed;
supplying pressurized air to the actuator at a higher speed upon determining that the free end of the movable part of the actuator is closer to the seat than a predetermined value.

35. The method according to claim 29, further comprising:

initially finding reference points on a mechanical structure, on which the crimps are provided, for positioning the wire output guide.

36. The method according to claim 29, further comprising:

creating a loose in the wire between the first and the second crimp.